UNMANNED AERIAL VEHICLE TEST FACILITY (UAV)

The Unmanned Aerial Vehicle Test Facility (UAV) supports the testing and development of UAV propulsion systems for the Navy, other Department of Defense (DoD) services, government agencies, and the commercial sector. This testing support verification of the operational capabilities and limitations of numerous UAV systems being considered for use in support of naval aviation. Altitude testing and temperature extreme capabilities exist for all UAV reciprocating and rotary (Wankel type) engines up to 500 hp and small turboshaft engines.

SUPPORTS VERIFICATION OF OPERATIONAL CAPABILITIES FOR USE IN NAVAL AVIATION

Testing Capabilities:

- Full qualification testing (altitude envelope and temperature extreme)
- Endurance testing
- Performance testing
- Propulsion systems integration testing
- Propulsion system components/ subsystems evaluation
- Vibration testing
- Fuel and lubricant testing (as it applies to engine performance)
- Full lubricant performance testing

Test Equipment/Instrumentation Capabilities:

- Low-humidity conditioned air supply system
- Fully Automatic Data acquisition system with storage capabilities of: 5000 max acquired and/or calculated steady state parameters; 500 max acquired and/or calculated real-time parameters; 500 max acquired and/or calculated transient, slow transient, and failure monitoring parameters.
- PSI calibration system (supports data acquisition and measurement systems used in cell)
- Altitude capability (0-25,000 ft)
- Various support subsystems: Electric dynamometer propeller simulator; low inertia hydro-dynamometer; free stream propeller testing capability

Unique Features/Accomplishments:

- Incorporates Fully Automatic Dynamometer Propeller Load Simulator
- Low Cost Testing Facility
- Long history of NAWCAD UAV engine testing
- Stand alone Inlet Air system conditions air at reduced cost
- Pioneer UAV powerplant (test/ evaluation) for performance, improvement, and durability testing; extensive endurance testing made it possible to triple this powerplant's service life
- Pioneer UAV In Flight Engine Loss Diagnosis using Altitude Capability to diagnose and determine solution for altitude related engine losses
- Short Range UAV engine competition testing: Performance (Altitude operation, Temperature Extreme Starting and Operation); Endurance (Durability Testing to identify failure modes, prove solutions)
- Heavy Fuel Engines: under the Joint Program Office of UAV's, three demonstrator engines were operated at Sea Level and Altitude Conditions to demonstrate Spark Assisted operation of small reciprocating engines burning JP-5 and JP-8 fuel (AAI/UEL Rotary Engine; DGI/Wankel Rotary Engine; SWRI/Cuyuan Piston Engine)
- Recuperative Turboshaft Engines (Demonstration testing of recuperative turboshaft engine to demonstrate the efficiency advantages within the altitude and temperature envelope of tactical UAV's)
- Envelope expansion and component improvement testing

For more information about Unmanned Aerial Vehicle Test Facility at the Naval Air Warfare Center Aircraft Division, Patuxent River, MD., contact 301-757-3420.